

Scott River Fall Chinook Spawning Ground Surveys 2021 Season



Siskiyou RCD field technician recording data from a male Chinook carcass encountered on the mainstem Scott River

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Introduction

The Scott River is an important spawning tributary for natural fall-run Chinook salmon in the Klamath Basin. Since 1992, escapement estimates have been compiled for the Scott River through cooperative spawning ground surveys organized by the California Department of Fish and Wildlife (CDFW) and the United States Forest Service (USFS). The objective of these surveys is to collect information on run parameters including the timing, duration, age composition, hatchery contribution, and redd distribution. The monitoring of this independent Chinook salmon population provides valuable trend data, including escapement estimates which are utilized by the Pacific Fisheries Management Council for the allocation of Klamath Basin fall run fish.

Fall 2021 Flow Conditions

Following a critically dry 2021 water year in the Scott Valley sub-basin of the Klamath River, streams throughout the watershed were very low and the Scott River in the valley reaches was dry with only isolated pools. In the last week of October, after receiving approximately 3 inches of rain, the Scott River mainstem connected through the tailings section of Reach 16 (river mile 55) on 10/22/2021 and through Reach 9 (river mile 26) by 10/23/21, connecting the Scott River through the entire valley and to most of its western tributaries including Shackleford Creek, Etna Creek, French Creek, Sugar Creek and the East and West forks of the Scott River. At this point, flow was too high to survey, and the turbidity of the river forced postponement of surveys until the start of November. The Scott River remained fully connected through Scott Valley for the duration of the survey period.

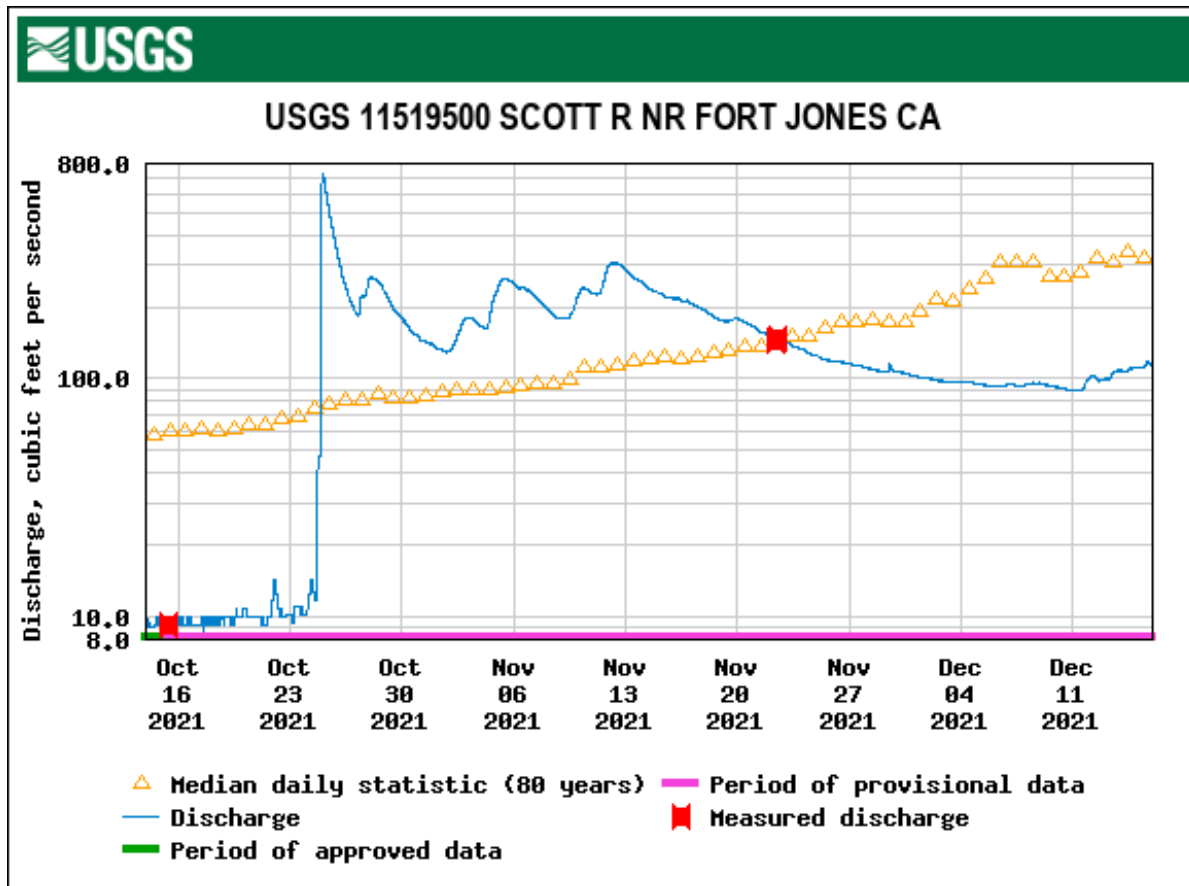


Figure 1: Scott River discharge at the USGS gage at river mile 21 (USGS, 2021)

Surveys

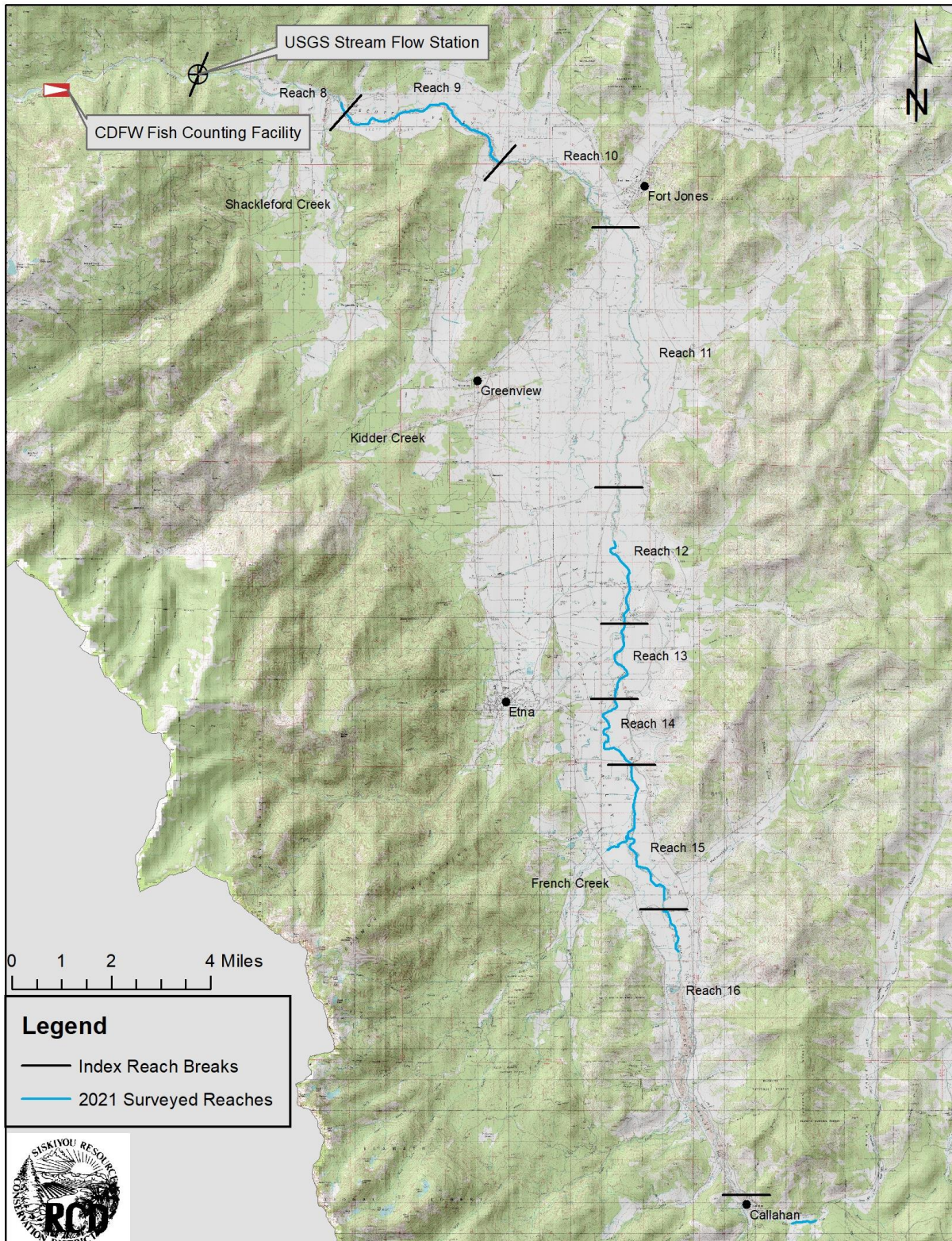
The Annual Scott River Spawning Ground Survey Training was held virtually online on October 13, 2021. All individuals who participated in the survey season attended the 2021 training or a previous year's training. RCD crew leaders were Chris Voigt and Jim Morris. Jim Morris, a former high school teacher, involved Etna High School students in the surveys. The Siskiyou RCD follows the protocol employed since 1992 to assess Chinook populations in the Klamath River Basin. This protocol has been used in the Scott River watershed for adult Chinook spawning ground surveys since they were initiated in 2001 (Maurer, 2002). All surveys were carried out following protocols and procedures detailed in the Klamath Basin Cooperative Spawning Ground Survey 2021 Training Manual (CDFW, 2021). Weather conditions over the fall of 2021 were fair to good for the observation of spawning—once water levels subsided and turbidity decreased by the start of November. There were two surveys that had to be postponed due to high water after a rain event in early November.

The RCD initiated spawning ground surveys through the Index Reaches of the Scott River Valley on November 1, 2021 (Table 1, Map 1). Scheduling involved a minimum of weekly surveys of Index Reaches 12 through 15 and weekly surveys of reach 9 as stream conditions permitted. Surveys were also regularly completed through portions of Index Reaches 8 and 16 as the run progressed. Only the lower portion of Reach 16 was surveyed in an effort to focus on high density spawning areas due to limited funding. The first 0.2 miles of reach 8 was surveyed as landowner access was granted. Surveys were also completed through 0.6 miles of lower French Creek

(independent of Index Reach 15) and a small section (0.4 miles) of the lower reach of the East Fork Scott River. Based on their observations of live fish numbers and redd construction, crews determined Chinook spawning had subsided and ended surveys on December 3, 2021. Map 1 indicates the index reach breaks and the tributary reaches surveyed.

Table 1. Scott River Mainstem Index Reaches					
Index Reach	Reach Description	Upstream River Mile	Downstream River Mile	Total Length	Length Surveyed
8	Meamber Bridge to USGS Stream Gauge	24.4	21	3.4	0.2
9	Oro Fino to Quartz Valley Bridge	28.6	24.4	4.2	4.2
10	Highway 3 to Oro Fino	35.6	28.6	7	0
11	Eller Lane to Highway 3	41.1	35.6	5.5	0
12	Etna Creek to Eller Lane	44.7	41.1	3.6	2.0
13	Horn Lane to Etna Creek	46.5	44.7	1.8	1.8
14	Young's Dam to Horn Lane	48.6	46.5	2.1	2.1
15	Fay Lane to Young's Dam	52.2	48.6	3.6	3.5
16	Callahan to Fay Lane	59.1	52.2	6.9	1.1
Total				38.1	14.9

Map 1. Stream reaches surveyed by the Siskiyou RCD during the 2021 fall-Chinook run.



Lives

CDFW operates the Scott River Fish Counting Facility (SRFCF) on the Scott River, which is situated at river mile 18.2 near the transition between the canyon and the low-gradient valley. A total of 1,400 Chinook were recorded passing upstream through the video weir from September 26 through November 21, 2021 and 561 were observed below the SRFCF (Morgan Knechtle, Pers. Comm. 2022). Even though the Scott River was disconnected through the valley over the summer of 2021, two large rain events resulted in robust flows at the end of October through early November of 2021. The USGS streamflow gage at river mile 21 remained around 150-300 cfs through most of the migration period (USGS 2021, preliminary data). As such, there was little concern over fish passage through problem areas such as Oro Fino, Young’s Dam and the tailings. Crews periodically checked these sites and it was determined that neither the shallow riffles through Oro Fino or the channels through Young’s Dam presented actual fish passage barriers because Chinook were documented on Reach 16 as early as November 5, 2021. Pairs of Chinook salmon were consistently encountered by RCD crews through the valley reaches of the mainstem from November 1 to November 18, 2021 (Appendix A).

Biological Samples

All carcasses found by field crews (excluding those that were inaccessible) were inventoried and chopped to indicate that they had been handled. Surveyors recorded the fork length, sex, and presence of hatchery markings on each carcass. They also checked females for evidence of pre-spawn mortality. A total of 80 Chinook carcasses were handled and inventoried by field crews over the season (Appendix B). Of these, 26% were females and 74% were males; the remaining 1% of the carcasses were too deteriorated to determine the sex. There was evidence of evidence of pre-spawn mortality; one pre-spawn female was found on Reach 9. There were not any recovered carcasses with hatchery markings.

Of the 80 recovered carcasses, 79 were in suitable condition to collect scale samples. (Appendix B). Gill plate and otolith samples were also gathered from selected carcasses —generally the first fish per reach on each survey day and every tenth fish thereafter. All samples were submitted to CDFW – Yreka Fisheries Office for further distribution and analysis.

Redds

Due to mild stream conditions, surveyors were typically able to find the pair of fish responsible for constructing a redd and observe the development of the spawning site from week to week. Redds identified on each survey were inventoried and flagged to indicate that they had been documented. Surveyors recorded habitat type, dimensions, superimposition and presence of fish in the vicinity of the site. GPS coordinates were collected for every redd where permitted by landowners.

Valley Reach	Total Number of Redds Identified
8 (partial access)	0
9	9
10	Not Surveyed
11	Not Surveyed
12 (partial access)	1
13 (partial access)	7

14	1
15	32
16 (partial access)	12 (one likely coho redd)
Total	62 (one likely coho redd)

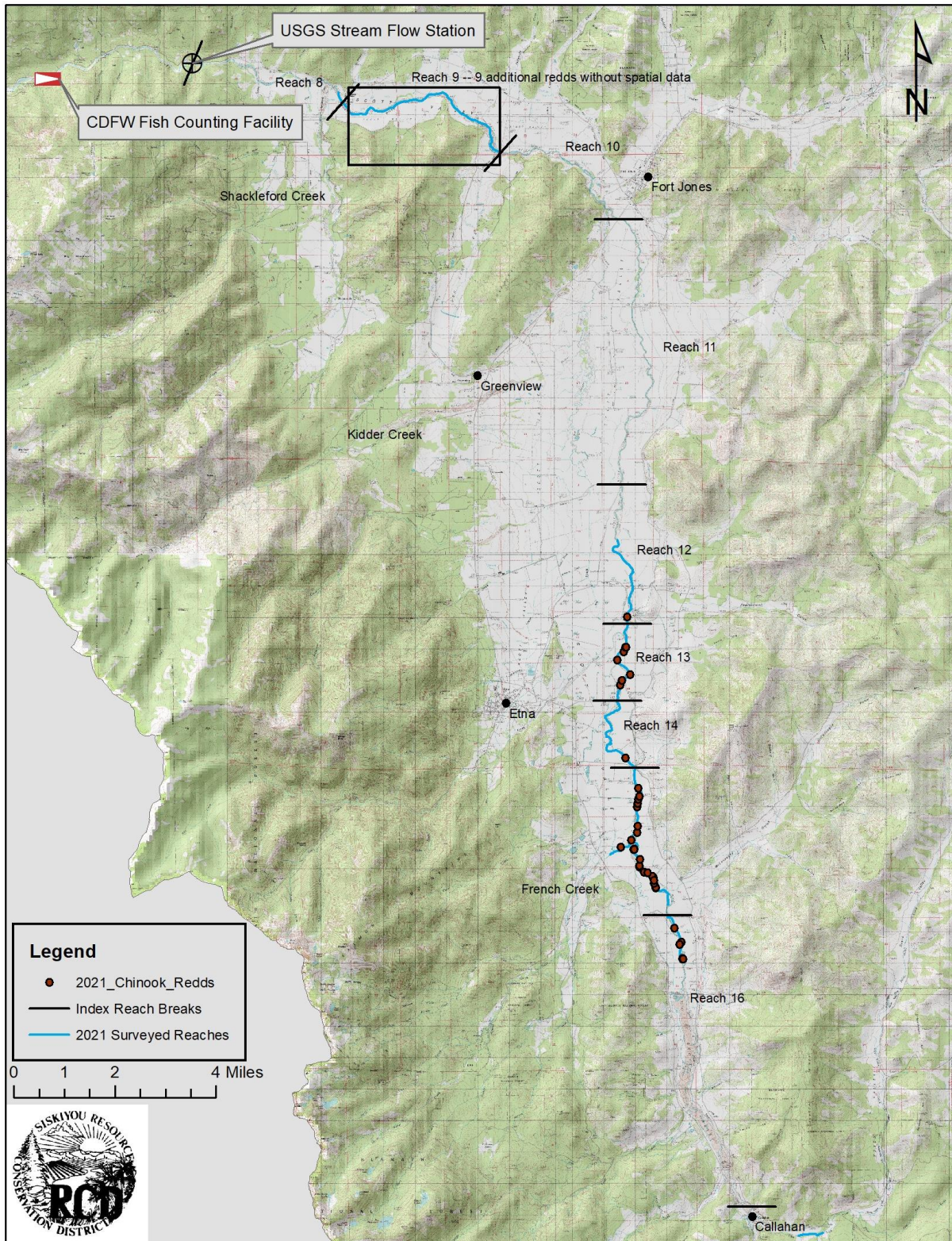
Surveys were conducted on

14.9 miles of the Scott River mainstem covering the Index Reaches 8-9 and 11-16. Surveys were not conducted through or above the historic mining tailings due to budgetary constraints. There was a decent amount of spawning observed on the mainstem with the distribution spanning most of the surveyed length (Table 2, Map 2). Relative spawning densities were highest on reaches 15 and 16 with 9.1 and 10 redds per mile, respectively.

Except for French Creek and a small section of East Fork, the other western tributaries of Shackleford Creek, Etna Creek, Kidder Creek Sugar Creek and South Fork were not surveyed due to limited funding which required surveyors to restrict themselves to areas where high concentrations of spawning had been witnessed in previous year. One survey was carried out though the lower 0.6 miles of French Creek. One redd with two live fish were encountered, however, they were most likely coho. (Table 3, Map 2).

Tributary	Total Number of Redds Identified
Shackleford Creek	Not Surveyed
Kidder Creek	Not Surveyed
Etna Creek	Not Surveyed
French Creek	1
Sugar Creek	Not Surveyed
Total	1 (likely coho redd)

Map 2. Chinook redds identified by the Siskiyou RCD during the 2021 fall run.



Conclusions

Since 1978, the natural Chinook escapement into the Scott River has ranged from 14,477 fish (1995) to 467 fish (2004) (Knechtle and Giudice, 2021). The total escapement in 2021 was estimated at 1,961 fish (Knechtle, Pers. Comm. 2022), which is significantly lower than the average of 5,050 fish.

The fall of 2021 was characterized by a large pulse precipitation events and then little precipitation thereafter. Although Chinook migration typically coincides with pulse flow events and despite the fact that there was ample flow through the duration of the spawning season, the high water in late October and early November may have limited or reduced additional observations of spawning activity. Additionally, the number of fish passing through the weir was less than half of historical averages, thus it was a well below average year for returning spawning Chinook. The spawning distribution and habitat utilization of the mainstem Scott River in 2021 can be considered typical of the species and the region, where the vast majority of spawning occurs on the mainstem Scott River mostly on Reach 9 and between Reaches 12-16, with reaches 15 and 16 above Young's Dam having the highest density of redds.

References Cited

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